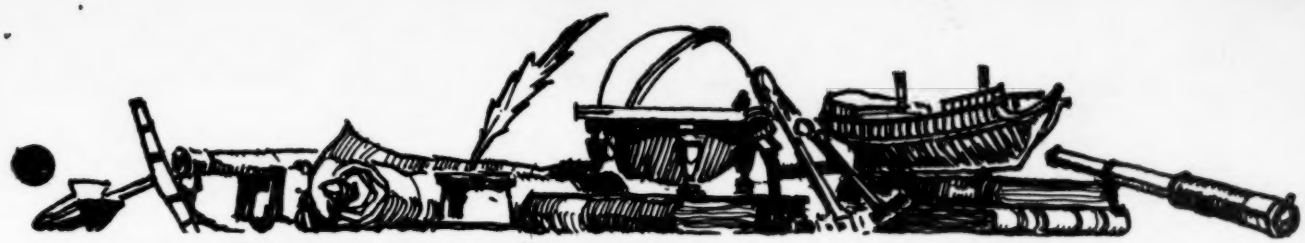

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ROCKETS AND BOMBS

BY

H. LESSEM AND E. RICH

FORT McHENRY NATIONAL MONUMENT AND HISTORIC SHRINE BY RESOLUTELY WITHSTANDING A 25 HOUR BRITISH NAVAL BOMBARDMENT MADE TWO SIGNIFICANT CONTRIBUTIONS TO AMERICAN HISTORY. THE SUCCESSFUL RESISTANCE HELPED MATERIALLY TO FRUSTRATE THE BRITISH PLAN TO CAPTURE BALTIMORE, AND OF GREATER IMPORTANCE, A GLIMPSE OF THE FLAG WAVING DEFIANTLY OVER THE BRICK RAMPARTS INSPIRED FRANCIS SCOTT KEY TO COMPOSE THE IMMORTAL LINES WHICH HAVE SINCE BEEN ADOPTED AS OUR NATIONAL ANTHEM.

IN A SENSE THE STAR SPANGLED BANNER IS A POETIC ACCOUNT OF WHAT KEY SAW AND THE EMOTIONS HE EXPERIENCED AS HE WITNESSED THE ATTACK ON FORT McHENRY. HOWEVER, IT IS THE PURPOSE OF THIS BRIEF ARTICLE TO RELATE NEITHER THE STORY OF THE WRITING OF OUR NATIONAL ANTHEM NOR THE BRITISH STRATEGY IN THE BALTIMORE CAMPAIGN. RATHER, IT IS OUR INTENTION TO GIVE A SHORT ACCOUNT OF THE ACTUAL ATTACK ON THE FORT AND A CONCISE DESCRIPTION OF THE WEAPONS EMPLOYED BY THE ATTACKING FORCE AND WHICH TODAY ARE COMMEMORATED IN THE LINE

"AND THE ROCKET'S RED GLARE, THE BOMB BURSTING IN AIR."

THE LACK OF ADEQUATE DOCUMENTARY MATERIAL MAKES IT PRACTICALLY IMPOSSIBLE TO COMPLETELY RECONSTRUCT THE BRITISH ATTACK ON FORT McHENRY. VICE-ADMIRAL COCHRANE'S REPORT TO THE ADMIRALTY IS VAGUE, AND OF LITTLE ASSISTANCE. LT. COL. ARMISTEAD'S ACCOUNT TO THE SECRETARY OF WAR IS MORE GRAPHIC BUT FAR FROM COMPREHENSIVE. HOWEVER, SINCE IT IS THE MOST SATISFACTORY AND RELIABLE CONTEMPORARY ACCOUNT AVAILABLE, IT PROVIDES MOST OF THE INFORMATION IN THE FOLLOWING PARAGRAPHS.

"BRITISH ATTACK ON THE FORT"

AT DAWN ON SEPTEMBER 13, 1814 SIXTEEN BRITISH VESSELS DROPPED ANCHOR ABOUT TWO AND ONE-HALF MILES BELOW FORT McHENRY AND OPENED AN INCESSANT AND WELL DIRECTED BOMBARDMENT." THE MAJOR PORTION OF THE BRITISH FIRE POWER WAS DELIVERED BY THE FIVE BOMB SHIPS WHICH HAD MOVED WITHIN TWO MILES OF THE FORT. DURING MOST OF THE ATTACK VICE-ADMIRAL COCHRANE MAINTAINED HIS SHIPS BEYOND THE RANGE OF THE AMERICAN GUNS, "A MOST DISTRESSING CIRCUMSTANCE" FOR THE DEFENDERS OF THE FORT. ABOUT 2 O'CLOCK IN THE AFTERNOON AN ENEMY BOMB WHICH EXPLODED IN THE SOUTHWEST BASTION DISMOUNTED A 24 POUND GUN AND INFLICTED CASUALTIES AMONG THE VOLUNTEER ARTILLERYMEN. DURING THIS EXCITEMENT THREE BOMB SHIPS MOVED CLOSER TO THE FORT BUT WERE QUICKLY DRIVEN OFF BY THE AMERICANS. DURING THE 13TH, THE MEN, ACCORDING TO ARMISTEAD, WERE EXPOSED TO A "CONSTANT AND TREMENDOUS SHOWER OF SHELLS." IT IS INTERESTING TO NOTE THAT HE MAKES NO MENTION OF ROCKETS IN DESCRIBING THIS PHASE OF THE BOMBARDMENT. SEVERAL CONTEMPORARY ACCOUNTS MAINTAIN THAT THE BRITISH EMPLOYED ROCKETS CONSTANTLY; ALL OF WHICH MAKES IT DIFFICULT TO DISCUSS THE ROLE PLAYED BY THE ROCKET VESSEL EREBUS, ONE OF THE 16 BRITISH SHIPS.

THE CRUCIAL PERIOD OF THE ATTACK OCCURRED SHORTLY AFTER MIDNIGHT ON THE 14TH WHEN 1200 BRITISH SAILORS MOVED INTO THE FERRY BRANCH OF THE RIVER, ON THE RIGHT OF THE FORT. IN THE LANDING FORCE WERE SOME BARGES EQUIPPED WITH ROCKET LAUNCHERS AND OTHERS WITH SMALL CALIBER CANNONS. BEFORE THE BRITISH COULD LAND, THEY WERE DETECTED BY THE AMERICANS AND SUBJECTED TO A TERRIFIC BARRAGE FROM THE AMERICAN GUNS, WHICH COMPELLED THE BRITISH TO RETIRE TO THE FLEET SAFELY BEYOND THE RANGE OF EVEN THE 42 POUNDERS, THE LARGEST CANNON OF THE FORT. THE FURIOUS NIGHT ARTILLERY DUEL WAS REPORTED IN THE NILES REGISTER AS SHAKING THE HOUSES IN THE CITY "TO THEIR VERY FOUNDATIONS". THE SAME ACCOUNT RELATED THAT "THE HEAVENS WERE LIGHTED WITH FLAME AND ALL WAS A CONTINUED EXPLOSION FOR ABOUT HALF AN HOUR". IN THIS STAGE OF THE BRITISH ATTACK, THEY DEFINITELY USED ROCKETS.

THE FAILURE OF THE LANDING FORCE CAUSED VICE-ADMIRAL COCHRANE TO SUSPEND OPERATIONS AND AT SEVEN O'CLOCK A.M. ON THE 14TH OF SEPTEMBER THE VESSELS CEASED FIRING AND BEGAN MOVING DOWNSTREAM.

LT. COL. ARMISTEAD ESTIMATED THAT THE BRITISH HAD HURLED FROM 1500 TO 1800 SHELLS AT THE FORT, OF WHICH NUMBER 400 FELL WITHIN THE WORKS. TWO OF THE BUILDINGS WERE "MATERIALLY DAMAGED," THE REMAINING THREE BUT SLIGHTLY.

THE CASUALTY LIST WAS AMAZINGLY LOW. OF THE DEFENDERS WHO NUMBERED MORE THAN A THOUSAND, ONLY 4 WERE KILLED AND 24 WERE INJURED. THIS IS ALL THE MORE ASTOUNDING SINCE THE HEAVY TIMBER FOR CONSTRUCTING SHELTERS FOR THE GARRISON DID NOT ARRIVE UNTIL AFTER THE ATTACK HAD BEEN TERMINATED.

THE BRITISH BOMBARDMENT OF THE FORT MADE A PROFOUND IMPRESSION UPON THE RESIDENTS OF BALTIMORE. ONE ACCOUNT NOTED THAT"4 OR 5 BOMBS WERE FREQUENTLY IN THE AIR AT A TIME, MAKING A DOUBLE EXPLOSION, AND WITH THE NOISE OF FOOLISH ROCKETS AND THE FIRINGS OF THE FORT—CREATED A HORRIBLE CLATTER." ANOTHER WROTE THAT THE ATTACK WAS "TERRIBLY GRAND AND MAGNIFICENT".

THERE IS NO DOUBT THAT THE BOMBS AND ROCKETS MENTIONED BY KEY WERE MORE THAN A FIGMENT OF POETIC IMAGINATION. TO THE DEFENDERS OF FORT MCHENRY AND THE CITIZENS OF BALTIMORE WHO APPREHENSIVELY WITNESSED THE ATTACK THEY WERE POWERFUL MISSILES OF DEATH AND DESTRUCTION.

THE ROCKET

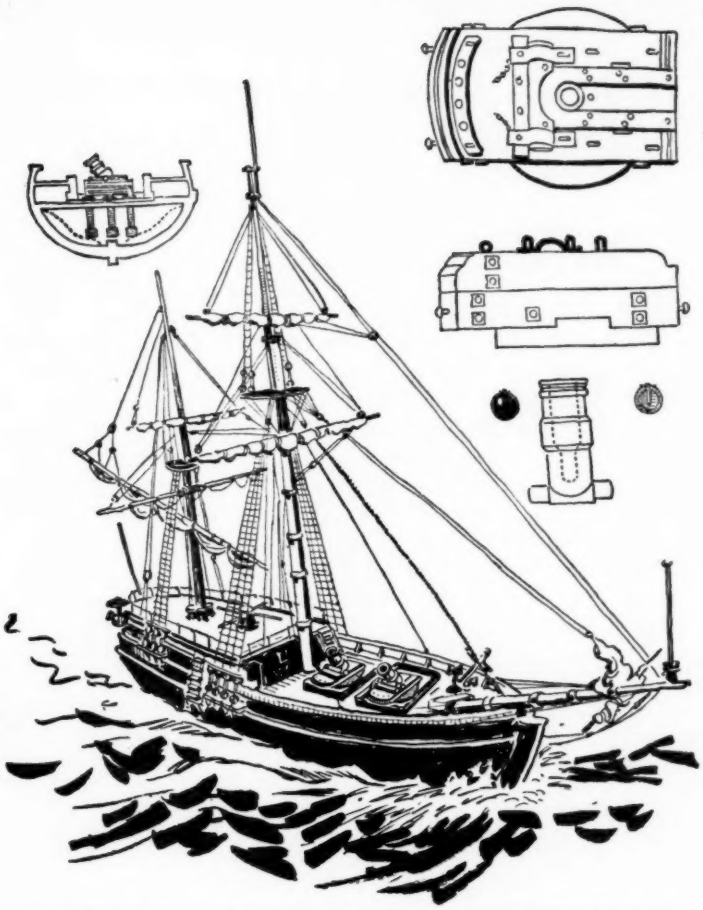
EARLY HISTORY. IT IS BELIEVED THAT THE EARLIEST RECORDED EMPLOYMENT OF ROCKET-PROPELLED MISSILES OCCURRED IN 1232 WHEN THE HARD-PRESSED DEFENDERS OF KAI-FUNG-FU UNLEASHED A SHOWER OF ROCKET-POWERED INCENDIARY ARROWS UPON A BESIEGING MONGOL ARMY. KNOWLEDGE OF THIS REVOLUTIONARY DEVELOPMENT SPREAD RAPIDLY WESTWARD FROM THE ORIENT, AND THROUGH THE WRITINGS OF ARABIAN SCHOLARS EUROPE BECAME AWARE OF ROCKETS AND THE APPLICATION OF ROCKET POWER FOR MILITARY PURPOSES. THAT THE ROCKET MADE A STRONG IMPRESSION UPON THE WESTERN SCIENTISTS CAN BE DEDUCED FROM THE ABUNDANT REFERENCES TO IT IN THE CONTEMPORARY LITERATURE. THE WRITINGS OF TWO OF THE INTELLECTUAL GIANTS OF THE THIRTEENTH CENTURY, ROGER BACON AND ALBERTUS MAGNUS, CONTAIN DIRECTIONS FOR THE MANUFACTURE OF ROCKETS. THE ROCKET VIED WITH THE CRUDE, NEWLY-INVENTED CANNON AS A WEAPON OF WAR, AND BY 1405 A VARIETY OF ROCKETS HAD BEEN DESIGNED FOR USE ON LAND AND SEA. ORDNANCE TEXTS OF THIS PERIOD LIST VERTICAL RISING ROCKETS, MESSAGE-CARRYING ROCKETS WHICH MOVED ALONG TAUT STRINGS, AND ROCKETS WHICH DROVE THROUGH WATER.

ALTHOUGH THE MILITARY ROCKET WAS USED IN THE WARS OF THE SUCCEEDING CENTURIES, IT GRADUALLY DECLINED IN SIGNIFICANCE, AND BY 1500 IT WAS PRIMARILY REGARDED AS AN ENTERTAINING FORM OF FIREWORKS. THE MAJOR FACTOR IN THE ECLIPSE OF THE ROCKET WAS ITS NOTORIOUS INACCURACY. ITS UTTER INSTABILITY IN FLIGHT, A DEFECT WHICH DEFIED CORRECTION, ENABLED THE CUMBERSOME BUT MORE RELIABLE CANNON TO TAKE THE LONG ROAD

ROCKETS AND BOMBS

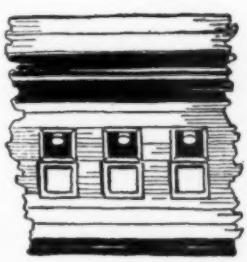
by

HAROLD I. LESSEM and EDWIN N. RICH



BRITISH BOMB SHIP with mortars in tandem, on pivots—with cross-section of ship showing great timber supports under the mortar beds; views of mortar beds from above and from one side; cross-section of mortar; and shell showing handles and fuse.

CROSS-SECTION OF GUN-BRIG converted into rocket ship. Scuttles cut in brig's side, below gun deck, for rocket tubes.



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WHICH EVENTUALLY LED TO THE DESIGNATION, "KING OF BATTLE". IN MARITIME WARFARE, TOO, WHERE THE RIGGING AND SAILS OF THE SHIPS WERE ESPECIALLY VULNERABLE TO THE INCENDIARY ROCKET, THE CANNON WAS SUPREME.

REVIVAL OF THE MILITARY ROCKET. THE STIMULUS WHICH REVIVED BRITISH INTEREST IN MILITARY ROCKETS ORIGINATED IN INDIA WHERE IN THE EIGHTEENTH CENTURY THE EAST INDIA COMPANY HAD BECOME INVOLVED IN A SERIES OF WARS WITH THE NATIVE RULERS. WRITTEN DESCRIPTIONS OF VARIOUS BATTLES INFORMED THE BRITISH THAT THE ROCKET WAS NOT AN OBSOLETE WEAPON. ACTUALLY, THE REFERENCES TO THE EMPLOYMENT OF SELF-PROPELLED MISSILES IN INDIA CAN BE "MULTIPLIED INDEFINITELY". TIPU, SULTAN OF MYSORE, ONE OF BRITAIN'S MOST FORMIDABLE OPPONENTS, WAS SAID TO HAVE A SEPARATE ROCKET CORPS OF 5000 MEN IN HIS ARMY. MOST OBSERVERS AGREED THAT WHILE THE ROCKET WAS NOT TOO EFFECTIVE AGAINST PERSONNEL, IT WAS CAPABLE OF DEMORALIZING RAW TROOPS AND STAMPEDING THE HORSES OF CAVALRY UNITS. THE STANDARD INDIAN ROCKET CONSISTED OF A 12 INCH LONG IRON CYLINDER TO WHICH WAS ATTACHED A BAMBOO STABILIZING SHAFT ABOUT 12 FEET LONG.

AT THE REQUEST OF THE ROYAL ARTILLERY, GENERAL DESAGULIERS, FIREMASTER OF THE LABORATORY OF THE WOOLWICH ARSENAL, BEGAN TO EXPERIMENT WITH ROCKETS. HOWEVER, THE LACK OF TECHNICAL KNOWLEDGE PRECLUDED ANY SUCCESSFUL RESULTS. IN 1804 WILLIAM CONGREVE, INTRIGUED BY THE MILITARY POTENTIALITIES OF SELF-PROPELLED MISSILES, INITIATED HIS EXPERIMENTS WITH THE LARGEST SKYROCKETS HE COULD PURCHASE IN LONDON. CONGREVE WAS FAVORED BY THE INTERNATIONAL SITUATION. ENGLAND, ENGAGED IN A LIFE AND DEATH STRUGGLE WITH FRANCE, WAS RECEPTIVE TO ANY WEAPON WHICH MIGHT STRENGTHEN HER MILITARY MIGHT. CONGREVE WAS GIVEN PERMISSION TO HAVE HIS TEST ROCKETS MADE IN THE WOOLWICH SHOPS AND TO CONDUCT HIS EXPERIMENTS ON THE ARSENAL PROVING GROUNDS. AT A PUBLIC DEMONSTRATION, MANY OF ENGLAND'S MOST INFLUENTIAL LEADERS WERE IMPRESSED BY THE PERFORMANCE OF THE ROCKET, AND IN 1805 CONGREVE WAS COMMISSIONED TO SUPERVISE THE OUTFITTING OF 10 ROCKET LAUNCHES WHICH WERE TO JOIN A FLEET BEING READIED TO ATTACK THE FRENCH PORT OF BOULOGNE.

THE ROCKET IN BATTLE. THE FIRST ATTACK ON BOULOGNE WAS A FAILURE. CONGREVE CLAIMED THAT A SUDDEN STORM SWAMPED FIVE OF THE LAUNCHES AND DISPERSED THE REMAINDER BEFORE A ROCKET COULD BE LAUNCHED. ANOTHER ACCOUNT ASSERTED THAT SOME OF HIS INCENDIARY MISSILES FELL HARMLESSLY INTO THE CITY AND WERE CARRIED THROUGH THE STREETS BY JEERING FRENCH SOLDIERS. UNDAUNTED, CONGREVE BUSIED HIMSELF IMPROVING THE ROCKET. HE SUBSTITUTED IRON FOR PAPER IN THE CONSTRUCTION OF THE BODY, SHORTENED THE BALANCING STAFF, BY THE USE OF IMPROVED POWDER INCREASED THE RANGE TO 3,000 YARDS. IN 1806 BOULOGNE WAS AGAIN ATTACKED. LARGE FIRES WERE STARTED BY THE INCENDIARIES, AND IN THE FOLLOWING YEAR COPENHAGEN WAS FIRED BY A TREMENDOUS SHOWER OF ROCKETS. THE PERFORMANCE OF THE ROCKET-PROPELLED INCENDIARIES CAUSED AN ARTILLERY OBSERVER TO DECLARE THAT THE ROCKET WOULD PROVE TO BE "A POWERFUL AUXILIARY TO THE PRESENT SYSTEM OF ARTILLERY". AN UNBROKEN STRING OF SUCCESSFUL ACHIEVEMENTS LED TO THE FORMATION OF THE ROCKET BRIGADE IN 1812. THE BRIGADE COVERED ITSELF WITH GLORY AT THE BATTLE OF LEIPZIG AND ASSISTED IN THE CAPTURE OF DANZIG BY FIRING THE WAREHOUSES. THE BRITISH CROSSED THE RIVER ADOUR, WHEN THE FRENCH FLED FROM THE ROCKETS AS IF THEY WERE "SOMETHING SUPERNATURAL". ANOTHER OFFICER REPORTED THAT "ITS VISIBILITY IN FLIGHT AND APPALLING NOISE HAD THE GREATEST MORAL EFFECT".

IN THIS COUNTRY THE ROCKETS STAMPEDED THE UNTRAINED MILITIA IN THE BATTLES OF BLADENSBURG AND NORTH POINT. HOWEVER, IT IS IRONIC TO NOTE THAT AFTER A LONG STRING OF SUCCESSES THE ROCKET IS COMMEMORATED IN A POEM WHICH WAS INSPIRED BY AN OCCASION ON WHICH THEY FAILED SIGNALLY.

THE 32 LB. ROCKET. BY 1814 THE BRITISH ARMED FORCES WERE USING ROCKETS RANGING FROM 6 TO 42 LBS. CONGREVE MENTIONED AN 8 INCH 300 LB. ROCKET, BUT THERE IS NO EVIDENCE THAT IT WAS EVER USED OR EVEN MADE. THE 32 LB. ROCKET, "THE MEDIAN POINT" IN CONGREVE'S SYSTEM OF CLASSIFYING HIS ROCKETS BY WEIGHT, HAD A BODY 42 INCHES LONG AND 4 INCHES IN DIAMETER WITH A POINTED HEAD. IT CONTAINED THE BLACK POWDER WHICH

UPON IGNITION GENERATED THE PROPELLING GAS. THE COMBUSTION WAS STARTED BY APPLYING A SLOW MATCH, PORTFIRE OR FLINTLOCK TO A FUSE WHICH IN TURN IGNITED THE POWDER. TO THE BODY WAS ATTACHED A WOODEN SHAFT, CAREFULLY INSPECTED FOR SIGNS OF WARPING, ABOUT 15 FEET LONG AND "ALIGNED IN TRUE DIRECTION OF THE AXIS OF THE ROCKET". THE SHAFT ISSUED TO THE LAND FORCES CAME IN SECTIONS AND PRIOR TO USE WAS JOINED BY IRON FERRULES. THE STICKS ISSUED TO THE NAVY WERE IN ONE PIECE. THIS IS SUPPOSED TO BE THE TYPE USED AGAINST FORT MCHENRY.

THE ROCKET COULD BE ARMED WITH THREE TYPES OF WARHEADS, INCENDIARY, EXPLOSIVE SHELL, AND CASE SHOT. THE WARHEADS WERE INTERCHANGEABLE, AND WERE ACTIVATED BY PAPER FUSES WHICH RAN ALONG THE EXTERIOR OF THE BODY TO THE VENT.

LAUNCHERS. "SINCE THE ROCKET CAN PROJECT ITSELF WITHOUT REACTION UPON THE POINT WHENCE IT DEPARTS", THE LAUNCHING MECHANISM COULD BE LIGHT AND MOBILE. IF NECESSARY, THE ROCKET COULD BE PLACED ON THE GROUND AND DISCHARGED IN THE DIRECTION OF THE TARGET. FOR AN ELEVATED TRAJECTORY THE ROCKET WAS PLACED ON A SLOPE OR THE SHAFT WAS INSERTED IN A HOLE. THE SMALLER MISSILES WERE LAUNCHED FROM A HOLLOW, COPPER TUBE WHICH WAS SUPPORTED BY A TRIPOD; FROM A TROUGH-LIKE CHAMBER FIXED TO THE GROUND BY FOUR IRON POINTS; OR FROM SMALL LAUNCHERS ATTACHED TO THE CARTS IN WHICH THE ROCKETS WERE TRANSPORTED. FOR THE LARGER ROCKETS A LADDER-LIKE FRAME WAS DESIGNED. IN THE NAVY THE FRAME WHEN USED ON SMALL BOATS WAS DIVESTED OF ITS LEGS AND SUPPORTED BY A MAST. IT WAS RAISED OR LOWERED BY HALLIARDS. ON LARGER VESSELS THE LAUNCHERS WERE INSTALLED ON DECK. H.M.S. EREBUS, ONE OF THE SHIPS THAT ATTACKED FORT MCHENRY, WAS EQUIPPED WITH SPECIAL FRAMES IN HER HOLD. THE HULL WAS PIERCED TO PERMIT THE DISCHARGE OF ROCKETS AS SHOWN IN THE ACCOMPANYING DRAWING AND DESCRIBED LATER.

LIKE THE ROCKET, THE LESS SPECTACULAR BUT MORE DEPENDABLE BOMB IS COMMEMORATED IN OUR NATIONAL ANTHEM. THE MASSIVE SHELLS WHICH THE BRITISH NAVY HURLED AGAINST FORT MCHENRY HAD GRADUALLY EVOLVED THROUGH THE CENTURIES FROM THE CRUDE HAND GRENADE AND PRIMITIVE INCENDIARY CARCASS. AS IN THE CASE OF THE ROCKET, THE REFERENCES TO THE USE OF THE BOMB CAN BE "MULTIPLIED INDEFINITELY." BY 1814 THE BOMB WAS THE CHIEF NAVAL WEAPON EMPLOYED AGAINST FIXED SHORE INSTALLATIONS.

BOMB. THE BOMB WAS A HOLLOW IRON SPHERE WHICH, ACCORDING TO A CONTEMPORARY DESCRIPTION, "DESTROYS THE MOST SUBSTANTIAL BUILDINGS BY ITS WEIGHT AND BURSTING ASUNDER CREATES THE GREATEST DISORDER AND MISCHIEF BY ITS SPLINTERS". THE LARGEST BRITISH BOMB WEIGHED ABOUT 190 LBS. AND WAS SLIGHTLY LESS THAN 13 INCHES IN DIAMETER. A SHELL OF THIS SIZE HAD WALLS 1 1/2 INCHES THICK, BUT OPPOSITE THE FUSE HOLE THE WALL WAS SLIGHTLY HEAVIER. THE BOTTOM WAS REINFORCED, SINCE IT RESTED ON THE POWDER CHARGE AND RECEIVED THE FULL IMPACT OF THE EXPLOSION. THE PROJECTILE NORMALLY CARRIED A BURSTING CHARGE OF 7 LBS. OF POWDER, THOUGH IT VARIED ACCORDING TO THE TYPE OF FRAGMENTATION DESIRED. BEFORE ACCEPTANCE BY THE NAVY, THE SHELL WAS EXAMINED FOR CRACKS AND HONEYCOMBS AND THE FUSE HOLE CHECKED FOR PROPER DIMENSIONS AND LACK OF DEFECTS.

FUSE. THE FUSE WHICH IGNITED THE BURSTING CHARGE WAS A SIMPLE TAPERED PIECE OF WOOD 8.52 INCHES LONG. WILLOW, LIME OR ALDER WOOD FREE OF SPITS AND KNOTS WAS FAVORED FOR THE MANUFACTURE OF THE FUSE. A .44 INCH CHANNEL WAS DRILLED LENGTHWISE THROUGH THE WOOD AND PACKED SOLIDLY WITH FINE POWDER. THE FUSE WAS THEN CAPPED WITH A MOISTURE-PROOF MATERIAL AND DISTRIBUTED TO THE ARMED FORCES. THE SMALL END OF THE FUSE WAS CUT AWAY TO PRESENT A LARGER BURNING SURFACE TO THE BURSTING CHARGE. WHEN INSERTED INTO THE BOMB, THE BOMBARDIER DROVE THIS WOODEN FUSE FIRMLY INTO THE FUSE HOLE, TAKING SPECIAL PRECAUTIONS NOT TO SPLIT THE WOOD. THE LENGTH OF THE WOODEN PLUG COULD BE VARIED BY CUTTING BACK ON ITS LOWER END, BEFORE ITS INSERTION INTO THE BOMB, THUS SHORTENING THE DISTANCE WHICH THE POWDER WOULD BURN BEFORE REACHING THE CHARGE.

MORTAR OF 1812. THE MORTAR WHICH HURLED THE BOMB WAS A SHORT, EXTREMELY HEAVY MUZZLE LOADER WEIGHING 8000 LBS. WITH A FULL POWDER CHARGE OF 30 LBS. AND ELEVATED TO 45 DEGREES, THE PIECE WAS CAPABLE OF THROWING A BOMB 4200 YARDS. SINCE THE FULL POWDER CHARGE TENDED TO MELT THE METAL OF THE POWDER CHAMBER AND ENLARGE THE VENT, BOMBARDIERS SELDOM USED MORE THAN 12 TO 15 LBS. OF POWDER. THE MORTAR RESTED ON A STURDY CARRIAGE, OR, AS IT WAS COMMONLY CALLED, A BED. A MASSIVE FRAME, MADE OF HUGE TIMBERS WHICH WERE FIXED TO THE DECK, SUPPORTED THE BED. POWERFUL UPRIGHT BEAMS BELOW THE DECK SUSTAINED THE ENTIRE MASS. THE BED WAS ATTACHED TO THE FRAME BY A PINTLE AND COULD BE ROTATED BY HANDSPIKES.

FIRING THE MORTAR. EVIDENTLY THERE WAS NO FIXED METHOD OF LOADING AND FIRING THE MORTARS. CONTEMPORARY LITERATURE REVEALS THAT SEVERAL METHODS WERE UTILIZED THOUGH ALL WERE BASICALLY SIMILAR. FALCONER DIRECTED THAT "THE PROPER AMOUNT OF POWDER BEING PUT INTO THE CHAMBER; IF THERE IS ANY VACANT PLACE, IT IS GENERALLY FILLED UP WITH HAY; SOME CHOOSE A WOODEN PLUG; OVER THIS THEY LAY TURF; SOME A TOMPION FITTED TO THE BASE OF THE PIECE, AND LASTLY THE BOMB, TAKING CARE THAT THE FIRE BE IN THE AXIS THEREOF, AND THE ORIFICE BE TURNED FROM THE MUZZLE OF THE PIECE. WHAT SPACE REMAINS IS TO BE FILLED WITH HAY, STRAW AND TURF, SO THAT THE WHOLE CHARGE MAY NOT BE EXPLODED WITHOUT THE UTMOST VIOLENCE." USUALLY THE BOMB FUSE WAS IGNITED AND THEN THE PIECE DISCHARGED. OCCASIONALLY THE BOMBARDIER DEPENDED ON THE BLAST OF THE EXPLODING POWDER TO IGNITE THE BOMB FUSE. TO FIRE THE MORTAR, THE GUNNER INSERTED A PRIMING WIRE INTO THE VENT TO PRICK THE CARTRIDGE. A PRIMER WAS THEN INSERTED INTO THE VENT AND IGNITED BY A PORTFIRE OR SLOW MATCH. THE PRIMER WAS A HOLLOW TIN TUBE OR QUILL, THE INTERIOR SURFACE OF WHICH WAS COATED WITH QUICK-BURNING POWDER.

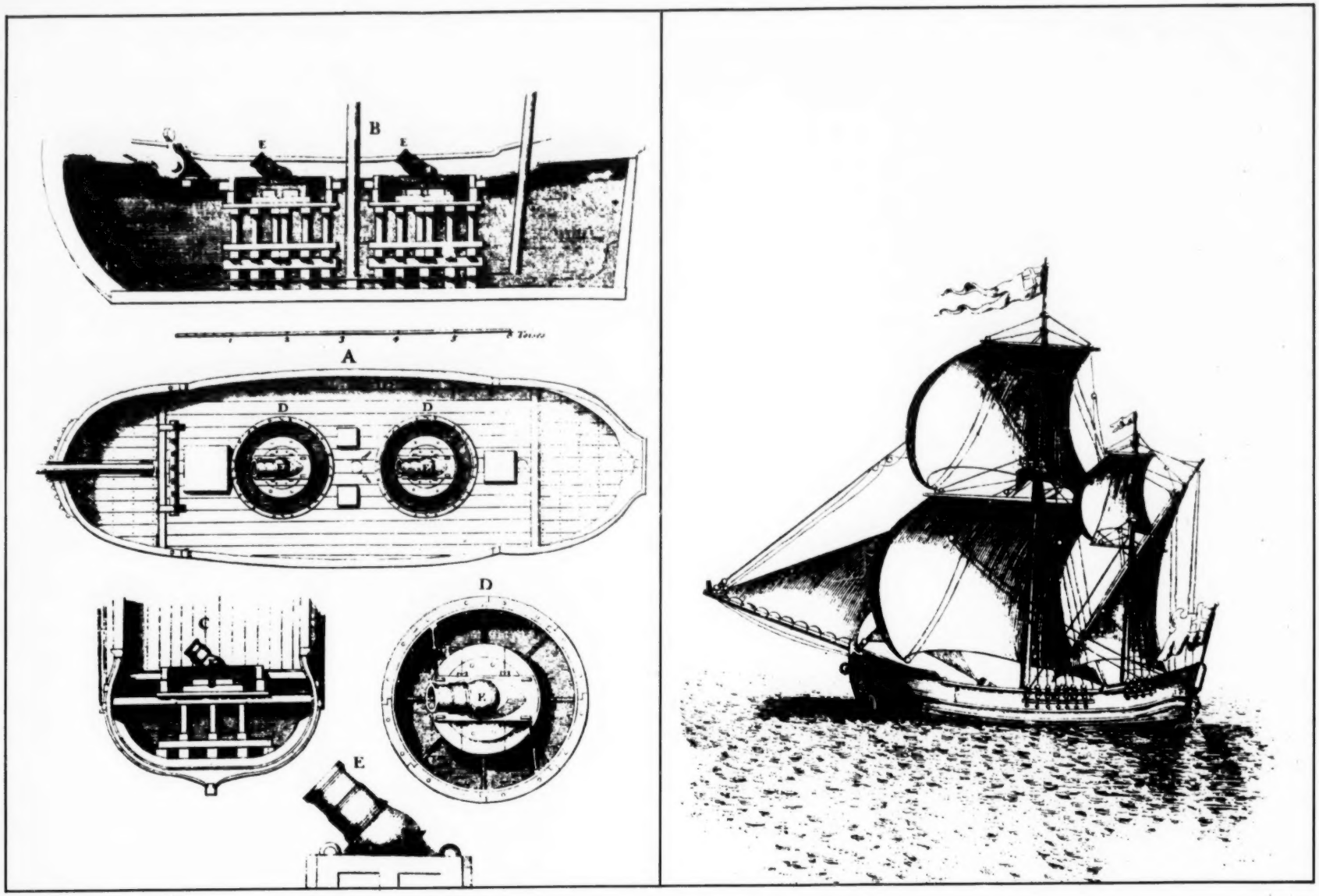
THE IMPLEMENTS REQUIRED TO SERVICE THE MORTAR WERE AN IRON LADLE TO CLEAN AND SCRAPE THE BOTTOM OF THE POWDER CHAMBER, A WOODEN SPATULA TO PACK THE EARTH BETWEEN THE BOMB AND THE BORE, AND HANDSPIKES AND CROW BARS TO POINT THE WEAPON. SINCE THE BORE OF THE MORTAR WAS SO SHORT, A REGULAR SPONGE ON A RAMROAD WAS NOT NEEDED. THE PIECE WAS SWABBED BY HAND WITH A MASS OF WET CANVAS.

BOMB KETCH. THE BOMB KETCH, ORIGINALLY A FRENCH DEVELOPMENT, WAS A SHORT, BROAD, POWERFULLY CONSTRUCTED VESSEL. A PRINT OF SUCH AN EARLY KETCH IS SHOWN WITH THE ACCOMPANYING ILLUSTRATION. IT WAS TAKEN FROM PIERRE DE SAINT REMEY'S MEMOIRS D'ARTILLERY, 1698 AND IS SUPPOSEDLY A FRENCH SHIP -- ALTHOUGH IT IS EVIDENTLY FLYING AN ENGLISH FLAG.

IT CARRIED TWO MORTARS, ONE BEFORE AND THE OTHER ABAFT THE MAINMAST. THEY WERE OF MORE PRIMITIVE CONSTRUCTION THAN THOSE OF THE LATER DATE. THE FIRST WEIGHED 12,900 POUNDS, TOOK 38 TO 40 POUNDS OF POWDER AND WAS ABOUT 12 INCHES IN DIAMETER SHOOTING A BOMB OF ABOUT 140 POUNDS (FRENCH POUNDS).

THE SECOND MORTAR ABAFT THE MAINMAST IS A SMALLER ONE OF 11,200 POUNDS BUILT ON ABOUT THE SAME PROPORTIONS OF THE FIRST. THE TWO PLATFORMS WERE BUILT UP FROM THE LOWER HOLD OF THE SHIP PARALLEL TO THE KEEL. THE EARLY MOUNTED MORTAR, WHICH HAD NO TRUNNIONS, TURNED ON A PIVOT INSIDE OF A CASING. THIS WAS LINED WITH LEAD TO COUNTERACT THE WEAR CAUSED BY ITS DISCHARGE. THIS SHIP DREW ABOUT 6 TO 7 FEET OF WATER, WAS ABOUT 62 FEET IN LENGTH AND WAS OF ABOUT THE YEAR 1697.

IN FALCONERS DICTIONARY OF THE MARINES THERE IS ILLUSTRATED A BOMB KETCH OF THE LATE 18TH CENTURY. SINCE THE KETCH HAD TO SUSTAIN THE ENTIRE IMPACT OF THE RECOIL CAUSED BY FIRING THE MORTAR IT IS BUILT OF THE HEAVIEST TIMBERS AND FITTED WITH FIVE FUTTOCK RIDERS UNDER EACH MORTAR ON EACH SIDE. A FUTTOCK RIDER WAS A TIMBER BOLTED TO THE FUTTOCKS, THAT IS THE RIBS OR FRAME TIMBERS TO REINFORCE THEM, EXTENDING FROM 2 FEET ON THE SIDE OF THE KEELSON TO THE LOWER SIDE OF THE BOMB BED BEAMS. THEY WERE TWELVE AND ONE-HALF TO FOURTEEN INCHES THICK. (NEIL SWANSON SHOWS DOTTED IN HIS DIAGRAM.) THE VESSELS RANGED FROM 100 TO 250 TONS BURDEN AND WERE FROM 60 TO 70 FEET IN LENGTH. THEY DREW 8 TO 9 FEET OF WATER. IN SOME CASES THEY



'RENCH DUNKERQUE BOMB KETCH, from Pierre Surirey de Saint Remey's Memoirs D'artillery of 1698

WERE ATTENDED BY A BRIG ON WHICH THE BOMBADIERS REMAINED UNTIL THEIR SERVICES WERE REQUIRED ON THE KETCH. IN COMBAT FIRE GUARDS EQUIPPED WITH WATER BUCKETS WERE POSTED THROUGH THE SHIP. SCREENS OF TAN HIDES OR WET TARPAULINS WERE SUSPENDED OVER THE MORTARS TO RECEIVE THE BACK-FIRE OF THE VENT. THE BOMBS WERE USUALLY PREPARED ABOARD THE TENDER AND WERE TRANSPORTED TO THE KETCH READY FOR USE. HOWEVER, IT IS MORE LIKELY THAT THE KETCH USUALLY CARRIED A SUPPLY OF POWDER AND BOMBS IN HER MAGAZINE AND HOLD, AND COULD, WHEN REQUIRED, ACT INDEPENDENTLY OF THE TENDER.

IT WAS NECESSARY TO MOOR THE SHIP BY TWO LARGE KEDGE ANCHORS AT THE BOW, HEAD ON TO THE TARGET, BEFORE THE MORTARS COULD BE FIRED. THE RIGGING WAS THE USUAL KETCH RIG AS THE DRAWING SHOWS WITH THE EXCEPTION THAT THE FORE STAY WAS MADE OF IRON CHAIN INSTEAD OF THE USUAL HEMP RIGGING. IN SOME ENGLISH KETCHES THE PLATFORMS WERE ABREAST BUT THE ILLUSTRATION IS THE MORE USUAL TYPE AS THE OTHER ARRANGEMENT WAS MORE LIABLE TO ERROR IN RANGE DUE TO THE ROCKING OF THE SHIP. POSSIBLY THE IDEA OF THE TURRET WAS A DEVELOPMENT OF THIS TYPE OF MOUNT.

THE RIG WAS USUALLY AS SHOWN WITH ONE OR TWO JIBS, MAINSAIL AND TOPSAIL ON THE MAINMAST AND LATEEN WITH SMALL TOPSAIL ON THE MIZZEN.

THIS ILLUSTRATION IS NOT THAT OF AN EXCEPTIONALLY BIG KETCH AS THE LARGEST OF THIS TYPE HAD A POOP DECK ABOUT 6 FEET ABOVE THE MAIN DECK IN WHICH THE AFT GUNS WERE MOUNTED.

THE SCIENCE MUSEUM IN SOUTH KENSINGTON, LONDON, ENGLAND HAS PHOTOGRAPHS OF OTHER BOMB KETCHES OF 1690, 1693, 1720, 1752, 1758 AND 1800 ALL ENGLISH AND ONE OF SPAIN OF THE LATE 18TH CENTURY. THESE ARE FROM DRAUGHTS OR MODELS IN THEIR POSSESSION WHICH SHOW THEIR DEVELOPMENT AND RIGGING DURING THEIR USE.

CAPTAIN PERCY ASHLEY HAS MADE A FINE MODEL OF ONE OF THESE LATER BOMB KETCHES, A DESCRIPTION AND PICTURE OF WHICH WAS PUBLISHED IN THE MAY 1929 SHIP MODELER MAGAZINE (PUBLISHED BY CAPTAIN MCCANN).

BOMB KETCHES WERE USED DURING THE 17TH, 18TH AND EARLY 19TH CENTURIES BY THE ENGLISH, FRENCH AND DUTCH. THE UNITED STATES USED SOME AT TRIPOLI WHICH WERE OBTAINED FROM THESE NATIONS.

THE PRINCIPAL ARMAMENT ON LATER VESSELS WERE TWO MORTARS OF 8 INCH TO 13 INCH BORE AS WELL AS 6 POUNDERS UNDER THE QUARTER DECK WITH 8 SWIVEL GUNS ON THE FORECASTLE AND QUARTER DECK OF THE LARGER SHIPS.

AT THE TIME OF THE ATTACK ON FORT MCHENRY THE BOMB KETCH HAD DEVELOPED INTO THE BOMB SHIP. THE AETNA BOMB SHIP WHICH WAS ONE OF THE VESSELS USED AT THE ATTACK IS A GOOD EXAMPLE OF THIS DEVELOPMENT. WHILE SHE RETAINED THE LINES OF A KETCH WITH RAISED POOP DECK, SHE HAD DEVELOPED A FORECASTLE, MAIN, MIZZEN AND FOREMAST, RIGGED WITH THE USUAL "SHIP RIG". HER BULWARKS WERE HIGHER THAN THOSE OF THE KETCH AND CONTAINED GUN PORTS FOR 5 GUNS OR CARRONADES TO A SIDE, IN ADDITION TO THE TWO MORTAR MOUNTS ON THE LINE OF THE KEEL AND MOUNTED BETWEEN THE FORE AND MIZZEN MASTS. PRESUMBABLY A 13 INCH MORTAR TO THE REAR AND 10 INCH FORWARD. HER LENGTH WAS 102 FEET, BREADTH 29 FEET $2\frac{1}{2}$ INCHES, DEPTH 12 FEET 6 INCHES AND SHE HAD A TONNAGE OF 367 TONS.

ADDITIONAL ROOM FOR LIVING QUARTERS, MAGAZINES AND WORKING SPACE WAS THUS OBTAINED, WITHOUT REDUCING THE STRUCTURAL DETAILS AND MASSIVE SUPPORTS UNDER THE MORTAR BEDS. IT IS INTERESTING TO NOTE THE IMPORTANCE ASSIGNED TO THESE BOMB SHIPS BY VICE ADMIRAL COCHRANE, AS FIVE OF THE ENTIRE STRENGTH OF THE BRITISH FORCES OF 7 OR 8 BOMB SHIPS, ACCORDING TO WILLIAM JAMES LISTS OF 1810-1814, WERE USED IN THIS ATTACK ON FORT MCHENRY. WE KNOW THAT THE TERROR, METEOR AND AETNA WERE THREE OF THESE VESSELS ALL ABOVE 300 TONS AND ALL OF SIMILAR ARMAMENT.

THE EREBUS ROCKET SHIP WAS ALSO THE ONLY SHIP OF THIS TYPE IN EXISTENCE AT THIS TIME. SHE WAS NOT A NEW SHIP, BUT FORMERLY HAD BEEN ARMED WITH 20 GUNS AND WAS SLOOP RIGGED. CONGREVE HAD ADDED A ROCKET BATTERY IN THE DECK BELOW THE GUN DECK FOR FIRING THE 32 LB. ROCKETS, PREVIOUSLY DESCRIBED. SMALL PORT HOLES OR "SCUTTLES" WERE PROVIDED WITH LIDS SIMILAR TO THOSE USED FOR THE SHIP'S GUNS BUT SMALLER. THE ROCKETS COULD BE FIRED FROM INSIDE THE VESSEL WITHOUT DANGER OF FIRE BY THE USE OF FIRING TUBES EQUIPPED WITH GUN LOCKS. THESE TUBES COULD BE RAISED OR LOWERED SO THAT THE ROCKET COULD BE FIRED HORIZONTALLY OR AT ANGLES UP TO ABOUT 75 DEGREES. A LANYARD WAS USED TO FIRE THE LOCKS. A FINE EXAMPLE OF THIS ROCKET SHIP CONSTRUCTION IS SHOWN IN THE ACCOMPANYING DIAGRAM TOGETHER WITH THOSE OF A BOMB KETCH, MORTAR AND MORTAR MOUNTS, ROCKET LAUNCH AND ROCKET SHIP IN ACTION TAKEN FROM NEIL SWANSON'S REMARKABLE BOOK "THE PERILOUS FIGHT". WE ARE INDEBTED TO THE AUTHOR AND THE PUBLISHERS FARRAR AND RINEHART FOR PERMISSIONTO REPRINT THEM IN THIS ARTICLE AND TRUST THAT OUR EFFORTS TOGETHER WITH THESE ILLUSTRATIONS WILL GIVE AN IDEA OF THIS HISTORIC ACTION, ITS WEAPONS AND THEIR DEVELOPMENT.

PORT OF LITTLE SHIPS

THE NEXT BEST THING TO A VISIT TO THE MUSEUM OF THE NAVAL ACADEMY IS THE ARTICLE IN THE OCTOBER I NUMBER OF THE SATURDAY EVENING POST UNDER THE ABOVE TITLE WRITTEN BY JACOB HAY. THERE, IN COLOR, ARE PHOTOS OF THE MODELS OF FAMOUS SHIPS AND PHOTOS OF CAPT. H. A. BALDRIDGE AND MR. FRED AVERY. THE MODELS ARE: THE NIGER, NEW BEDFORD WHALER; U. S. BRIG FAIR AMERICAN; THE CONSTITUTION; BRITISH ADMIRALTY MODEL OF THE ST. GEORGE AND H.B.M. DUKE 98. FOR SHIP MODELERS THE DESCRIPTION OF MR. AVERY'S SHOP IS ALL TOO BRIEF. THE PICTURES OF THE MODELS ARE BEAUTIFUL BUT WE WOULD LIKE TO KNOW MORE ABOUT MR. AVERY'S RIGS, JIGS AND GADGETS.

"SAILING SHIP"- PART I - HISTORICAL NOTES

- - -

OWING TO THE GREAT PUBLIC DEMAND, A FURTHER EDITION OF THIS HANDBOOK DEALING WITH THE HISTORY OF MARINE ARCHITECTURE, PREPARED BY THE LATE G. S. LAIRD CLOWES, M.A.,A.I.N.A., HAS BEEN PUBLISHED BY H.M. STATIONERY OFFICE.

THE BOOK BRIEFLY DESCRIBES THE DEVELOPMENT OF SHIPS FROM THE EARLIEST PERIODS OF HUMAN HISTORY OF THE MEDITERRANEAN LITTORAL AND TRACES THE PROGRESS IN FORM AND STRUCTURE, TOGETHER WITH THE NUMEROUS MECHANICAL IMPROVEMENTS ADDED TO THE MASTS AND RIGGING THROUGHOUT THE AGES, UNTIL THE VIRTUAL DISAPPEARANCE OF THE SAILING SHIP AT THE BEGINNING OF THE 20TH CENTURY.

THE WORK HAS BEEN COMPILED WITH SPECIAL REFERENCE TO THE NATIONAL SHIP COLLECTIONS AT THE SCIENCE MUSEUM AND IS FULLY ILLUSTRATED WITH 38 PLATES, LINE DRAWINGS, ETC.

COPIES OF THIS HANDBOOK, PRICE 4S.0D., (BY POST 4S.3D.), MAY BE OBTAINED FROM THE SCIENCE MUSEUM, LONDON, S.W.7. (NOTE: THIS PRICE WAS IN EFFECT BEFORE THE DEVALUATION OF THE POUND.)

THE STORY OF MAPS

A REVIEW BY DR. BERNARD BERENSON

THE STORY OF MAPS BY LLOYD A. BROWN, PUBLISHED BY LITTLE, BROWN AND COMPANY. THE TEXT IS GOOD, PARTICULARLY AS IT TREATS ON THE HISTORICAL DEVELOPMENT OF THE SCIENCE OF NAVIGATION. THE ILLUSTRATIONS OF MAPS ARE TOO FEW AND POORLY SELECTED, THE FRONTISPIECE IS NOT WORTHY OF SUCH A BOOK, CONSIDERING WHAT MIGHT HAVE BEEN SELECTED FOR THE ONLY COLORED ILLUSTRATION IN THE BOOK. THE ILLUSTRATIONS OF OLD NAUTICAL INSTRUMENTS ARE GOOD, BUT SOME ILLUSTRATIONS ARE POORLY REPRODUCED. FOR MY PERSONAL INTEREST IN THE DEVELOPMENT OF MAPS AND THE HISTORY OF NAVIGATION, I THINK THE BOOK WILL PROVE SATISFACTORY, BUT I WOULDNOT ADVISE THE AVERAGE COLLECTOR OF NAUTICAL BOOKS OR STUDENTS OF NAUTICAL EVENTS TO BUY IT, PARTICULARLY AT THE PRICE OF $7.50.

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DOLPHIN STRIKERS

By Winthrop Pratt, Jr.

In answer to Mr. Diefenbach's query No. 37 about dolphin strikers and in the hope that I may help others with the same problem, I offer the following notes.

Davis, Ship Model Builder's Assistant, says the dolphin striker first appeared about 1797, while Anderson, The Sailing Ship, says the earliest record of this fixture is 1794. Chapman, Architectura Navalis Mercatoria, 1768, shows no example while Steel's work of 1794 does show it. If Steel knew of this fixture it was perhaps first used a little before the date of his book, as it would have taken some time to write it and to have it printed. He is to the best of my knowledge, the first author to mention the dolphin striker.

Clowes in the Science Museum's booklet Part I - Sailing Ships, shows a picture of a contemporary model of a British 28-gun frigate of 1785, but says it had been rigged according to Steele's 1794 work on rigging. It is this model to which Anderson had reference.

Truxton's Remarks on Latitude and Longitude, to which is Annexed Capt'n. Truxton's System of Masting, is believed to be the first book of its type published in the United States, and was dated June 23, 1794. The drawing, made by Truxton himself, shows a dolphin striker fixed to the fore side of the cap and both perpendicular to the waterline. This is the same year that Steele's book appeared in England, and his plate of the ship is dated August 1st, 1794, more than a month later than Truxton's. It would seem therefore, that the dolphin striker probably did appear some time before 1794, perhaps as much as a few years earlier.

A contemporary painting of the New England-owned ship ARBELLA dated as late as 1828 shows the bowsprit and jib-boom, but positively no dolphin striker. This is the latest example I have found, and is undoubtedly an exception, as by this time all vessels were so equipped. The earliest picture of an American ship I have found which had a dolphin striker, is dated 1795 (excepting Truxton's drawing of the year previous).

Davis also says that "American vessels were distinguished by their dolphin strikers standing vertically, while foreign craft had theirs raked directly in line with the fore-topmast stay". He also says that the French, Spanish and Italians had a "cow's-horn" shaped dolphin striker, and that he believed it to be unique. He further says that the swinging type became popular in the 1820's.

I have carefully examined more than two hundred contemporary paintings and prints of vessels of all nations, rigs, and periods, and only those by recognized painters of their respective eras, including the Roux family, Pellegrini, Corsini, Vittaluga, Weytz, Montardier, Adam, MacFarlane, Cooke, Corne, and many others. The facts are interesting. The "Cow-horn" or crooked type does appear to be peculiar to the Latin countries, but the dolphin striker in line with the foretopmast stay was not. Of fourteen examples only six were French, while eight were on American ships. Dates were between 1801 and 1872, with most of them in the 40's and 50's.

As to the vertical or perpendicular type - of sixty nine examples studied, nine were before 1799, 32 between 1800 and 1829, 21 between 1830 and 1850, 6 in the 1850's and one as late as 1881. This cross-section includes American, French, English, Spanish, and Austrian vessels, and the examples were about evenly distributed among those nations.

Considering those strikers set at right-angles to the bowsprit, I checked 58 examples - the earliest being 1796 and on an American vessel. There were nineteen before 1840, thirty between 1840 and 1859, and eight after 1859. These examples

WERE ALSO TAKEN FROM VESSELS OF VARIOUS NATIONS, INCLUDING BOTH ENGLISH AND AMERICAN, AND AGAIN THE TYPE DID NOT PREDOMINATE IN THE SHIPS OF ANY ONE NATION.

WHAT APPEARS TO HAVE OCCURRED IS A NORMAL DEVELOPMENT OF THE DOLPHIN STRIKER AMONG ALL NATIONS, EACH BEING QUICK TO ADOPT ANY CHANGE OR IMPROVEMENT. AS TO THE ANGLE AT WHICH THE STRIKER WAS SET, THE FIRST WERE RIGIDLY FIXED TO THE CAP, SO WERE QUITE NATURALLY VERTICAL AS WERE THE CAPS AT THIS TIME. HOWEVER, ACCORDING TO CLOWES THE STRIKERS OF 1800 (AT LEAST ENGLISH ONES) WERE "PROVIDED WITH JAWS LIKE THOSE OF A GAFF," AND THOSE EXAMPLES I HAVE SEEN WERE SET JUST BACK OF THE CAP UNDER THE BOWSPRIT, AND I FOUND ONE AS LATE AS 1820. ON THE OTHER HAND, I FOUND EXAMPLES OF THE SWINGING STRIKER ON THE UNDER SIDE OF THE CAP ITSELF (WITHOUT JAWS) AS EARLY AS 1800. DOUBLE OR "FORKED" DOLPHIN STRIKERS LIKE THOSE ON OUR EARLY FRIGATES APPEAR TO HAVE BEEN INVARIABLY FIXED TO THE FORE SIDE OF THE CAP, HOWEVER. ALL OF COOKE'S PRINTS OF 1828-9 (ENGLISH) SHOW THE SINGLE STRIKERS SWINGING FROM THE UNDER SIDE OF THE CAP WITH THE EXCEPTION OF ONE OR TWO FOREIGN VESSELS WHICH HAD THEIRS JUST BACK OF IT ON THE BOWSPRIT.

TO SUM UP THEN, IF ONE MAY DRAW A FAIR CONCLUSION FROM SUCH A STUDY, THE DOLPHIN STRIKER APPEARED FIRST ABOUT 1790-1794 AND THOSE PRIOR TO 1799 WERE GENERALLY FIXED. THOSE OF ALL THE SUCCEEDING YEARS OF SAIL APPEAR TO HAVE BEEN ALMOST UNIVERSALLY OF THE SWINGING TYPE, WITH SOME EXCEPTIONS, ESPECIALLY THE FORKED STRIKERS. AFTER THE 1820'S THE SWINGING TYPE WAS VIRTUALLY THE UNIVERSAL ONE, AND THE MAJORITY OF THEM WERE SET VERTICALLY BY ALL NATIONS UP TO ABOUT 1850 (WITH A FEW EXCEPTIONS) AND AFTERWARDS THEY WERE GENERALLY SET AT RIGHT ANGLES TO THE BOWSPRIT. THOSE SET IN A LINE WITH THE FORETOPMAST STAY WERE NEVER AS COMMON AS THE OTHERS.

AS TO THE REASONS FOR THE THREE DIFFERENT ANGLES, IT WOULD SEEM THAT THE VERTICAL WAS A CARRY-OVER FROM THE FIRST FIXED TYPES, AND THOSE SET IN LINE WITH THE FORETOPMAST STAY MAY HAVE BEEN TRADITIONAL ON THE MEDITERRANEAN SHIPS - PERHAPS EXPERIMENTAL ON OURS, I DON'T KNOW. THE HINGED DOLPHIN STRIKER SET AT RIGHT ANGLES (OR NEARLY SO) TO THE BOWSPRIT APPEARS TO HAVE BEEN THE FINAL DEVELOPMENT, AND TO HAVE BEEN FOUND FROM PRACTICE TO RENDER THE GREATEST SUPPORT AND FLEXIBILITY.

SAILING DAYS ON THE PENOBSCOT
A REVIEW BY CHARLES F. H. MENGES

SAILING DAYS ON THE PENOBSCOT, BY GEORGE WASSON. A NEW EDITION OF THE BOOK FIRST PUBLISHED IN 1932 BY THE MARITIME RESEARCH SOCIETY BY W. W. NORTON, N. Y.

IN SPITE OF THE EXTENSIVE SHIPBUILDING AND MARITIME ACTIVITY DURING THE PAST CENTURY, THE PENOBSCOT RIVER AREA OF MAINE HAS BEEN STRANGELY NEGLECTED IN THE HISTORY AND FOLK LORE OF NEW ENGLAND SHIPPING AND SHIP BUILDING. THIS NEGLECT MAKES MR. WASSON'S BOOK PARTICULARLY INTERESTING — AND PARTICULARLY DISAPPOINTING.

GEORGE WASSON KNEW THE PENOBSCOT WELL. HE GIVES A DETAILED AND HIGHLY VALUABLE ACCOUNT OF ITS ACTIVITY IN THE BOOMING DAYS WHEN BANGOR WAS ONE OF THE WORLD'S GREAT LUMBER PORTS — AN ACTIVITY THAT IS ALMOST UNBELIEVABLE AS ONE SEES THE RIVER TODAY. HIS DESCRIPTIONS AND DELIGHTFUL ANECDOTES OF COASTAL CRAFT AND THE ODDLY ASSORTED VESSELS AND TRADES NECESSARY WHEN WATER WAS THE PRINCIPAL MEANS OF TRANSPORT, TRAVEL AND COMMUNICATION ARE A VALUABLE ADDITION TO MARITIME HISTORY.

HOWEVER, IT IS REGRETTABLE THAT MR. WASSON WAS NOT MORE CONCERNED WITH WHAT HE CALLS "DRY FIGURES". HE PAINTED AN EXCELLENT PICTURE OF THE RIVER, BUT GIVES LITTLE OF THE BACKGROUND THAT GAVE THE PICTURE REASON. HIS CHAPTER ON "SHIPBUILDING ALONG THE RIVER", FOR INSTANCE, EXCEPT FOR SOME RATHER BITTER REMARKS ABOUT THE ATTEMPTED RENAISSANCE DURING THE FIRST WORLD WAR, IS HARDLY ABOUT SHIPBUILDING AT ALL.

FOR A HUNDRED YEARS, VESSELS FROM 25 TO 2500 TONS WERE BUILT IN EVERY CONVENIENT

COVE AND INLET FROM BANGOR TO ROCKPORT AND IT IS UNFORTUNATE THAT THE AUTHOR HAD SO LITTLE TO SAY ABOUT THOSE VESSELS AND THE MEN WHO BUILT THEM. IN THE ORIGINAL EDITION, THIS WAS PARTIALLY REMEDIED BY THE INCLUSION OF AN APPENDIX, COMPILED BY LINCOLN COLCORD, LISTING THE VESSELS BUILT ALONG THE RIVER AND BAY. THIS LIST GIVES ONLY THE BRIEFEST ACCOUNTS OF EACH VESSEL, IS ADMITTEDLY INCOMPLETE, AND CONTAINS A NUMBER OF INACCURACIES. BUT IT IS THE ONLY PUBLISHED ACCOUNT THAT GIVES ANY IDEA OF THE NUMBER, SIZE AND TYPE OF VESSELS BUILT IN THAT AREA AND IT SEEMS UNFORTUNATE THAT IT WAS FELT NECESSARY TO OMIT IT IN THE PRESENT EDITION.

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NEWS FROM LONDON
BY H. V. EVANS

THE MODEL ENGINEER EXHIBITION WAS MOST SUCCESSFUL THIS YEAR. MY OWN SHIP MODEL WAS LUCKY AND EARNED FOR ME A "HIGHLY COMMENDED DIPLOMA". THIS IS A PLAQUE MODEL OF A REVENUE CUTTER OF 1810. IT WAS MOUNTED IN A PICTURE FRAME — A HALF HULL AND CARVED WOOD SAILS ON A PAINTED BACKGROUND — AFTER THE PRACTICE OF SHELLBACKS OF THE PAST CENTURY. W. H. HONEY WAS AWARDED THE "COMMENDED DIPLOMA" FOR A MODEL OF A TOPSAIL SCHOONER IN AN ELECTRIC LIGHT BULB. NEXT YEAR WE MUST SEE IF ARRANGEMENTS CANNOT BE MADE WITH ONE OF THE AIRLINES FOR SOME MODELS MADE BY FELLOW AMERICAN MEMBERS OF THE N. R. G. TO BE SENT OVER FOR EXHIBITION ALSO. (NOTE: MR. EVANS HAS SENT A COPY OF THE SECRETARY'S MONTHLY LETTER TO THE THAMES SHIPLOVERS AND MODEL MAKING SOCIETY WHICH GIVES A DESCRIPTION OF SOME OF THE MODELS. IT MAY BE LOANED TO ANY MEMBERS.

ARK HALF THE SIZE OF THE QUEEN MARY

NEW YORK. NOAH'S ARK, WHICH FIVE AMERICANS ARE SEEKING ON MOUNT ARARAT IN TURKEY, MEASURED ABOUT HALF THE SIZE OF THE BIG LINER QUEEN MARY, ACCORDING TO THE ARK'S DIMENSIONS GIVEN IN THE BIBLE. IN THE BOOK OF GENESIS, NOAH WAS DIRECTED TO BUILD AN ARK IN PREPARATION FOR THE FLOOD. HE WAS TOLD: "THE LENGTH OF THE ARK SHALL BE 300 CUBITS, THE BREADTH OF IT 50 CUBITS, AND THE HEIGHT OF IT 30 CUBITS." A CUBIT IS 17.58 INCHES, MAKING THE ARK 439½ FEET LONG, WITH A BEAM OF 73¼ FEET AND A HEIGHT OF 44 FEET. THE LINER QUEEN MARY, ONE OF THE WORLD'S LARGEST, IS 975 FEET LONG. BIBLICAL HISTORIANS GENERALLY SET 2,348 B.C. AS THE YEAR THE ARK MADE ITS TRIP. (SAN FRANCISCO EXAMINER)

Dedicated to the Era of Sail

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Harry D. Hamilton, Secretary-Treasurer
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RIGGING LINES

A Discussion by Thomas Hornsby

In the August Letter Mr. Wm. Honey has taken exception to my notes on the use of linen as rigging material, and I wish to make a few remarks relating to his experiments and conclusions.

First. The "eggbeater" principle of laying up rigging is not unknown here and has been used in various forms for many years. Mr. Honey's method while ingenious, has definite limitations - it will not make a length more than the height of the scaffold (in this case a seven foot bookcase) and as Mr. Honey admits is very awkward to operate. Furthermore there is a loss of about one third in the laying up process and it would seem difficult to salvage a piece more than five feet long. I suggest that those considering building a rope making machine examine the one proposed in the MARINER, January 1936 issue. This machine is electrically operated and will make rope in continuous lengths. Second. The tests conducted beside an open window in "wet weather" are not conclusive - nor are they applicable to the rigging of models, since we do not rig or store models by open windows when raining. Third, Mr. Honey complains of the shrinkage of linen - but he neglects to observe that the linen is pre-shrunk by my dyeing process, and that there is little or no shrinkage left in the material. Fourth. Mr. Honey objects to the strength of linen - a term almost synonymous with longevity, and a factor in which I am greatly interested. Mr. Honey states, "Linen lines...are not suitable for <u>my</u> models". In reply to this emphatic statement I can only state that I long ago discarded cotton, and that I do not consider it suitable for my models or those of my customers.

In general my notes were offered for the average modelmaker and meant to suggest a material that is readily available for their use. Small threads right and left hand (linen) are almost impossible to obtain here since the war. It may be true that Mr. Honey is forced to rig models under severe climatic conditions, in an area noted for its rains and heavy fogs, but I do not think these conditions exist here. Observations of models rigged with linen over a period of years do not show pulled out eyebolts or warped spars in my experience.

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STONINGTON AND HUDSON RIVER SLOOPS
ANSWERS TO QUERY NO. 47 BY HARRY E. ERSKINE

EXCERPTS FROM A LETTER TO HARRY ERSKINE BY JOHN J. FLYNN. "REGARDING YOUR QUERY PERTAINING TO CAPT. N. B. PALMER'S SLOOP HERO, HER SPARS, ETC., MAY I REFER YOU TO THE BOOK, NATHANIEL BROWN PALMER, AN OLD TIME SAILOR OF THE SEA BY SPEARS - MCMILLAN, PRINTED IN 1922.

SPEARS SAYS -- 'IN SEVERAL RESPECTS THE SLOOP WAS A MOST INTERESTING VESSEL. AN OLD DOCUMENT SHOWS THAT SHE WAS BUILT AT GROTON, CONN; SHE WAS OWNED BY W. A. FANNING AND ELISHA FAXTON BOTH OF STONINGTON, AND SHE MEASURED 44-40/95 TONS, AS PER REGISTER GRANTED AT NEW LONDON THE 7/25/1820'. THE DIMENSIONS OF THE HERO OTHER THAN HER TONNAGE HAVE BEEN LOST, BUT THE RULE UNDER WHICH HER TONNAGE WAS CONSIDERED IN CONNECTION WITH THE PURPOSE FOR WHICH SHE WAS BUILT, IT APPEARS THAT SHE WAS NOT TO EXCEED FIFTY FEET LONG ON DECK BY SIXTEEN OR SEVENTEEN WIDE AND SIX OR SEVEN FEET DEEP.

FROM A PREVIOUS CHAPTER: 'CONSIDER THE SLOOPS THAT WERE COMMONLY USED. SOME OF THEM WERE FROM 50 - 75 FEET LONG. THE MASTS WERE MUCH TALLER THAN THE HULLS WERE LONG AND SOME BOOMS WERE FIVE FEET LONGER THAN THE HULLS. A 75 FOOT SLOOP COMMONLY HAD A MAST 84 - 85 FEET TALL WITH A BOOM THAT WAS 80 FEET LONG.'"

SLOOPS OF THE HUDSON FROM YACHTING, SEPTEMBER 1932, BY C. G. DAVIS
SUBMITTED BY JOHN M. MINUSE

"IN 1780 FIVE ALBANY CAPITALISTS FORMED A COMPANY AND HAD A SLOOP BUILT WHICH THEY NAMED THE EXPERIMENT, OF THE FOLLOWING DIMENSIONS: 60 FT. LONG, 20 FT. 1 IN BEAM, 7 FT. 6 IN. DEPTH AND 75 77/95 REGISTERED TONNAGE. SHE WAS HANDSOMELY FITTED OUT FOR CARRYING PASSENGERS BETWEEN ALBANY AND NEW YORK AND PROVED SUCH A SUCCESS THAT IN 1787 THE COMPANY BUILT ANOTHER SLOOP OF THE SAME TYPE AND FOR THE SAME PURPOSE. AT THE CLOSE OF THE REVOLUTIONARY WAR THIS LITTLE KEEL SLOOP EXPERIMENT WAS SENT ON A VOYAGE TO CHINA, UNDER CAPT. DEAN, AND RETURNED TO NEW YORK A YEAR AND A HALF LATER.

THIS MAY SEEM A VENTURESOME VOYAGE FOR SUCH A SMALL VESSEL, YET THERE IS EVIDENCE OF MANY MORE SUCH UNDERTAKINGS. CAPT. N. B. PALMER, IN 1821 TOOK IT ALL AS PART OF HIS EVERYDAY WORK TO SAIL THE LITTLE CONNECTICUT SLOOP HERO CLEAR AWAY DOWN SOUTH BEYOND CAPE HORN AFTER SEALS, IN COMPANY WITH SEVERAL OTHER SEALING VESSELS; AND JOHN BOIT, JR., IN 1794, HAD SAILED THE 89 TON SLOOP UNION, A CRAFT OF ABOUT 60 FOOT LENGTH, FROM NEWPORT, R.I. AROUND THE HORN TO THE NORTHWEST COAST IN QUEST OF SEALS, AND THEN HAD SQUARED AWAY FOR CHINA, LEAVING THERE IN MARCH, 1796, AND ARRIVING HOME AT BOSTON ON JULY 8TH, 1796, THUS CIRCUMNAVIGATING THE GLOBE ON HIS VOYAGE. THE 90 TON SLOOP LADY WASHINGTON IN COMPANY, PART WAY AT LEAST, WITH THE SHIP COLUMBIA, 212 TONS BURDEN, ROUNDED CAPE HORN, WHERE THE TWO VESSELS BECAME SEPARATED, AND THE SLOOP WAS THE FIRST OF THE TWO TO ARRIVE UPON THE NORTHWEST COAST IN 1788, WHERE FOR YEARS SHE TRADED BETWEEN THERE AND CHINA."

NOTE BY MR. MINUSE: THERE IS A FINE MODEL OF THE SLOOP EXPERIMENT IN THE SAILOR'S SNUG HARBOR AT STATEN ISLAND, N. Y. THIS MODEL WAS MADE BY CAPT. BLANCHARD. I BELIEVE OFFICIAL PAPERS OF THE SLOOP EXPERIMENT MAY BE FOUND IN THE LIBRARY OF THE MUSEUM OF THE NEW YORK HISTORICAL SOCIETY, CENTRAL PARK WEST, NEW YORK, N.Y.

ANSWER TO QUERY NO. 47 BY WINTHROP PRATT, JR. THE SLOOPS OF THE HUDSON BY VERPLANK AND COLLYER IN WHICH MENTION IS MADE TO THE EFFECT THAT MANY WERE SOLD UP THE SOUND AND IN CONNECTICUT AND THAT SOME WERE SO LARGE AS TO BE LATER RERIGGED AS SCHOONERS. MENTION OF 90 FEET MASTS IS ALSO MADE. SEE ALSO CHARLES G. DAVIS, THE DEVELOPMENT OF THE SLOOP IN YACHTING, FEBRUARY 1933.

QUERIES

Query No. 48 Scow-sloops, by Harry E. Erskine. There is another type of craft that too little is known about by the younger generation. I refer to the sloop and schooner scows that carried cargo on the Bangor River, up and down the Atlantic coast, the great Inland Lakes and along the North Pacific Coast in the early days of our country's merchant marine. I remember, as a boy, going along with the men of our town in a scow-sloop, sloop-rigged with lee-boards, sweep for steering and cabin forward with a wood stove for wet weather, to get loads of sawdust from the bar on Sawdustpoint just above Bucksport, Me. The Bangor Mills were running full time then, at turn of century, and sawdust and all kinds of lumber stuff came down the river. I'd like to "ship aboard" one of those old scows for a cruise again. (Note: See Article by Fred S. Rice in Jan. 1949 Journal - Fairy Boats Sailing through the Meadows.)

Query No. 49 Scow-schooners, by Wayne B. Yarnall. Does anyone have information concerning the history and development of the scow-schooners which were used extensively in the South Carolina rice-fields?

Query No. 50 Cyrus Stocker and his Ship Mortar, by E. N. Rich. Does anyone have any information on Cyrus Stocker and his ship mortar for firing incendiary bombs equipped with fish hooks? This is mentioned in No Ship May Sail by Charles F. Haywood in 1942. A story of 1812 based on old records. A supposed Yankee invention of that time.

Query No. 51 Wayne B. Yarnall. Who can lend me the book Sea-boat - How to Build and Rig Her, by R. C. Leslie?

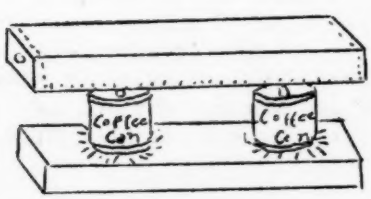
Query No. 52 A Discussion on Wood for Ship Models, Harry D. Hamilton. Wood for all parts of the ship. What do you use and why and where can it be purchased? This should include mahogany, black walnut, sugar pine, etc.

RIGS, JIGS and GADGETS - from the shop of Henry C. Diefenbach

A modeler should try to get a few discarded surgeons hemostats (clamps). Grind these to a slim-nosed plier design and they make excellent vises for holding small parts, starting small pins, holding rigging and many places where a small clamp is needed.

Plaster casting is not difficult with rubber moulds. I get latex and other necessary materials at a local art store, follow directions, and learned to make rubber moulds. It is really very simple.

RIGS, JIGS and GADGETS - from the shop of Eric Swanson



P.S. Ends and bottom about 1" thick wood

About gadgets — the tools I use for small stuff I have made myself. I have made a rigging jenny from an old electric windshield wiper, for lines and ropes and another for spinning wire. A hand rig - an electric drill from an old vacuum cleaner motor, to which is attached an automobile speedometer cable. The chuck is a small three jaw extension chuck and a home made pistol grip handle with a switch. I hang it overhead on a beam and it is out of the way. Chuck is ground so it will take the finest sewing needles and up to 3/16" and can use any polishing tool and such. Made a good rig for a steam box — 2 coffee cans with a piece of 1/4" feed line pipe soldered to the lids and stuck into the

BOTTOM OF THE BOX. I MADE A BOX OF A PIECE OF BENT TIN WITH THE BOTTOM OF WOOD — ONE END PIECE TIGHT, THE OTHER LOOSE. SPACED THE HOLES IN THE BOTTOM TO FIT CENTER OF THE TWO ELECTRIC STOVE BURNERS. BOX ABOUT 3' LONG AND ABOUT 5" x 5" SO I CAN STEAM QUITE A FEW PIECES AT A TIME AND IT WORKED FINE. I MADE A LATHE FOR TURNING CAPSTANS AND BUCKETS AND ANYTHING; USED THE SAME CHUCK AS ON MY SMALL HAND DRILL. MADE A GEARED OUT RIG FOR SERVING FOOT ROPES AND THE ENDS OF RIGGING. I WILL TELL YOU ABOUT THESE AND THE SPINNING JENNEY LATER.

ANSWER TO QUERY NO. 41 BY JOHN J. FLYNN—BY WINTHROP PRATT, JR. ABOUT 1/4" BRADS. TRY A. J. FISHER, 1002 ETOWAH AVE., ROYAL OAK, MICHIGAN, AND ASK FOR HIS #475, 1/4" SPECIAL BRADS. THESE SELL AT 10¢ PER PACK IN EITHER 1/4" OR 3/8" LENGTH, AND ARE A PUSH-FIT FOR A #76 DRILL HOLE. I THINK THEY ARE A BIT FINER THAN YOUR #25. JAMES BLISS & CO., 220 STATE ST., BOSTON, MASS., ALSO SELLS FISHER'S BRADS — SAME PRICE. I'VE USED THEM FOR YEARS, AND COULDN'T GET ALONG WITHOUT THEM. IF I REMEMBER CORRECTLY THERE ARE ABOUT 175-200 IN A 10¢ PACK.

CUTTYHUNK LINE — JOHN M. MINUSE. I HAVE FOUND A PLACE IN NEW YORK WHERE YOU CAN BUY RIGGING LINE FROM SIZE #2 TO 39. REAL IRISH LINEN CUTTYHUNK LINE — 50 FT. LENGTHS. #3 IS VERY SMALL — SIZES 3, 6, 9, 12, 15, AND 18 ARE GOOD SIZES FOR RIGGING. ADDRESS: ANGLER'S ROOST, CHRYSLER BLDG. ARCADE 42ND. ST AND LEXINGTON AVE. THEY HAVE SAMPLE CARDS. THIS LINE CAN BE EASILY DYED.

PLEASE CONSIDER THAT OUR REMARKS ON THE NEED FOR NEW MEMBERS IN THE SEPTEMBER "LETTER" ARE REPEATED HERE AND NOW....QUERY NO. 46 BILLY-BOY HAS HAD THREE MORE ANSWERS WHICH ARE IN THE MAIN SIMILAR TO THAT OF ROBERT A. NASH, EXCEPT THAT GORDON GRANT DOUBTS VERY MUCH THAT THEY CAN BE SEEN TODAY AND WINTHROP PRATT, JR. QUOTES A PASSAGE FROM "FORE AND AFT" BY CHATTERTON WHICH STATES THAT "TODAY (1912) THEY ARE GONE"... EDW. N. RICH CALLS ATTENTION TO AN ILLUSTRATION OF THIS CRAFT IN BLOOMSTER'S SAILING AND SMALL CRAFT DOWN THE AGES AND FURTHER SAYS THAT ALL MEMBERS SHOULD OWN THIS BOOK—A PUBLICATION OF THE UNITED STATES NAVAL INSTITUTE, ANNAPOLIS, TO MEMBERS AT 4.40 AND TO OTHERS AT 5.50...CAPT. BOOTH CAME IN FOR HIS SHARE OF ANSWERS AND SUGGESTIONS FOR HIS SHOW BOAT WITH THE POPULAR CHOICE BROUGHT DOWN TO THREE FAMOUS SHIPS, BOUNTY, MAYFLOWER AND HALF MOON — WITH THE BOUNTY THE FAVORITE...C. G. BERGER HAS RECEIVED THE OFFSETS AND LINES OF YOUNG AMERICA FOR WHICH HE IS VERY GRATEFUL.... WE BELIEVE THE ANSWERS TO QUERY NO. 47 — SHIPS BELLS BY DR. BERNARD BERENSON WILL PROVE INTERESTING — WHEN WE GET THEM.... THE OBSERVATION BY JOHN J. FLYNN ON THE TRUNNIONS OF THE MAYFLOWER'S GUNS HAS BROUGHT US A VERY FINE ARTICLE FROM EDW.N. RICH, WHICH WILL INTEREST OUR GUNNER'S MATES — IN A SUBSEQUENT ISSUE...THERE IS CONSIDERABLE INTER-MEMBER CORRESPONDENCE WHICH WE WISH TO ENCOURAGE AND THAT IS THE REASON WE GIVE THE ADDRESS OF ALL MEMBERS BUT PLEASE SEND US THE INTERESTING ITEMS FOR THE BENEFIT OF ALL MEMBERS...WE CAN USE MORE RIGS, JIGS AND GADGETS.

CORRECTIONS—IN MR. ECKSTEIN'S ARTICLE IN THE SEPTEMBER "LETTER" PAGE 119, ON THE 4TH LINE, CHANGE THE NAME OF THE SHIP AMERICA TO ENTERPRISE AND CORRECT THE SPELLING OF CLERMONT. ON THE 8TH LINE MAKE IT READ—"VERY LITTLE DISCREPANCY WILL BE FOUND ETC." IN THE 6TH PARAGRAPH, ADD THE WORD "NOTE" BEFORE THE SENTENCE — "THERE ARE MANY GUILD MEMBERS, ETC." THIS WAS AN OBSERVATION OF THE SECRETARY.